



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

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DENVER, COLORADO 80202-2405

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Arlene Loble, City Manager  
Park City Municipal Corporation  
445 Marsac St.  
Park City, Utah 84060

FILE PLAN

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Dear Arlene:

Enclosed are two copies of the "Draft Analytical Results Report for Ambient Air and Residential Characterization at Prospector Square, Park City, Utah." As we discussed at our meeting at the State Health Department on March 28, we have developed tentative recommendations in this letter regarding interim measures that would minimize the exposure potential to the residents from the exposed tailings. We can discuss these draft recommendations and our findings in the study at our meeting in a couple of weeks.

In the ambient (outdoor) air study, sixteen contaminants were detected in high-volume air samples collected at Prospector Square. Chromium, copper, aluminum, magnesium, manganese, iron, lead and zinc were all found at elevated levels in downwind samples compared to upwind samples. Although levels in the downwind samples were elevated, the overall levels of airborne contaminants were quite low.

Seasonal variations in wind direction and speed as well as rainfall did not measurably affect airborne contaminant levels. Airborne contaminants measured at Richardson Flat did not appear to contribute to the concentrations observed at Prospector Square on days when the elevated levels were recorded.

In the residential characterization study, we found the major area of contamination to be in the residential soils. The highest levels of lead, arsenic, manganese and zinc in soil samples were consistently found at Prospector Square residences, the community located closest to the exposed tailings. Lead levels were significantly higher in the residential soils at Prospector Square compared to the other three zones. Soil contaminant levels were lowest in Snyderville, the background community. A similar pattern of contaminant concentration was found in downwind high-volume air samples collected as part of the ambient study.

The lead concentrations in settled dust reflected the same pattern as that found in soil samples. The concentrations in the settled dust were higher in December than July.

The pattern of contaminant levels found in the high-volume air, residential soil, and indoor settled dust samples was not observed in residential airborne dust samples. In most cases, the contaminant levels of the residential air samples were non-detectable or close to the detection limit. Radon concentrations, as expected, were slightly higher in December compared to July sampling episodes, although none of the levels of radon gas detected was above the EPA action level of 4 picocuries per liter (pCi/l).

### RECOMMENDATIONS

The major areas of contamination found in the study are the exposed tailings area and the residential soils at Prospector Square. The major exposure pathway from either of these sources is most likely ingestion. However, in some instances inhalation may provide an additional exposure pathway. EPA's recommendations focus on minimizing the exposure of the residents under either of these two pathways.

#### 1. EXPOSED TAILINGS:

a.) The remaining exposed tailings should be covered with at least six inches of suitable cover. This will help reduce the exposure to the residents of Prospector Square, particularly those residents who live within two hundred feet of the exposed tailings and who would be exposed more frequently and to higher concentrations than would residents who live farther from the tailings.

b.) Depending upon the future use of the exposed tailings area, more permanent measures should be considered which would protect the integrity of the cover for the long term. Eighteen inches to two feet of suitable soil cover with grass or native vegetation is recommended to ensure the effectiveness of the cover over the long term. Two feet of soil cover will minimize the concentration of elevated levels of metal contaminants which would be expected near the soil surface as a result of annual plant recycling of soil nutrients. The concentration of metals in the upper soil profile could, if unmitigated, reach toxic levels for plants, thus reducing overall vigor of the vegetation and accelerating the erosion process. An alternative to two feet of soil cover would be the development of the property in a manner (i.e. buildings and pavement) that would effectively eliminate the potential for exposure from the tailings.

c.) Measures such as building codes and safety practices would need to be taken during any construction or disturbance of the tailings area to minimize exposure to the workers or near-by residents from fugitive dust.

d.) Institutional controls are an additional means of ensuring that the integrity of the cover is maintained over the long term. Such controls could include zoning ordinances and/or covenants on the property to ensure that future owners are aware of the importance of maintaining the soil/vegetative cover.

## 2. RESIDENTIAL SOILS:

The high levels of lead, arsenic, manganese and zinc found in the residential soils can not be solely attributed to the levels of airborne contaminants migrating from the exposed tailings. The high level of contaminants in the residential soils is in part due to the tailings material underlying most of Prospector Square. We are concerned that individual landscaping practices may not ensure adequate cover of the tailings material at present or in the future. Activities such as gardening (both vegetable and flower) or the planting of bushes and trees could present a potential exposure pathway to the residents. Other activities that could present a possible exposure pathway to residents include construction, street repair, or utility maintenance.

a.) EPA recommends further testing of residential soils to identify those areas with elevated levels of metals. Based on the results of such testing, a number of options may be considered to ensure adequate cover of the tailings. Residences where the yards have already been landscaped may be more limited in the options available.

b.) EPA has at its disposal the means of testing the residential soils with a quick turn-around (1 day) time, should the city wish to have further testing done.

Additional soil capping efforts would be recommended if surface soil samples (upper 1 inch) have lead levels in the range of 1000-2000 ppm (milligrams per kilogram soil). If the surface soil levels are greater than 2000 ppm in a residential area after capping and other remedial efforts, those efforts are likely to have been ineffective and additional remedial activities are warranted. Additionally, if the soil levels are greater than 2000 ppm, we recommend that a survey of the priority pollutant metals be run and additional risk assessment analysis completed. Testing of soils using X-ray fluorescence scans would be an appropriate technique.

c.) A soil cover of six inches will break the human exposure pathway presented by the residential soils, however, six inches of soil will not ensure long term protection. If the grass in a landscaped yard is currently showing signs of stress (not due to a lack of watering or maintenance), the possibility of

insufficient suitable soil cover for the grass roots must be considered. For yards that are not yet landscaped, residents may wish to consider placing up to two feet of suitable soil cover over the tailings material. We also recommend the addition of limestone or a similar calcium carbonate enrichment to the soil as a means of minimizing the effects of high metal concentrations.

For those vacant lots that were covered with six inches of suitable soil cover under the Special Improvement District authority, EPA considers that measure to be a temporary remedy until the lots are developed. EPA assumes that that cover will be maintained. At the time that the lots are developed, measures will need to be taken during construction to minimize exposure to the near-by residents and to the workers. Additional soil cover up to two feet on these undeveloped lots should be considered as part of any landscaping effort.

d.) Generally, for flower or vegetable gardening, the practice of turning over the soil would not disturb more than the one foot of cover. However, for trees or bushes, additional soil material is generally excavated during landscaping. Particular attention in digging up tailings material in such locations should be taken to ensure that such material is not mixed with suitable soil material or placed at the surface. To ensure healthy trees and bushes, a resident may wish to consider the selection of species with a high tolerance to metals such as lead, cadmium, zinc or manganese. At the time of planting trees or bushes, the excavation of additional material and replacement with suitable soil material may be desirable to ensure an adequate supply of suitable material for rooting as the plant grows. However, the disposal of this 'tailings' material in a suitable place needs to be addressed.

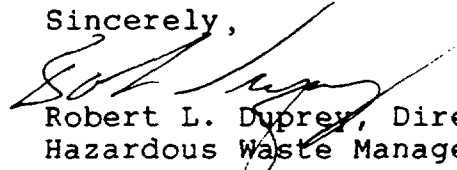
The evaluation for the potential effects of the metals upon plant growth are much more variable. However, generally, the human health criteria will also be protective to plants. At this particular site, metals other than lead will likely be the offending agent. Zinc and copper are likely candidates with additional effects expected from the remaining metals. We recommend that additional sampling be completed in areas with stressed vegetation, after capping or other remedial efforts have been put in place. We recommend that the soil samples be composited from the surface to a depth of 24 inches. Testing of the soils using X-ray fluorescence scans would be appropriate.

e.) Institutional controls are an additional means of ensuring that the integrity of the cover is maintained over the long term. Such controls could include zoning ordinances and/or covenants on the property to ensure that future owners are aware of the importance of maintaining the soil/vegetative cover.

The above measures are recommended as a means of reducing the residents' exposure to elevated levels of metal contaminants posed by the exposed tailings area and the residential soils. By covering the exposed tailings and increasing the soil cover of the yards, the potential for exposure through ingestion or inhalation can be significantly reduced. Following implementation of the above recommendations or other measures deemed appropriate, EPA recommends that the city or the state conduct additional monitoring to ensure the effectiveness of these measures.

As I suggested at the meeting on March 28, we are willing to meet with the State and Park City to discuss the findings of the study and our draft recommendations. EPA is interested in receiving the State and the City's comments prior to finalizing the report and releasing it to the public. I would like to suggest a meeting date of Wednesday, June 1, 1988. If this is acceptable, please contact Paula M. Schmitt diel of my staff at (303) 293-1518 to confirm a time and location for our meeting.

Sincerely,

  
Robert L. Duprey, Director  
Hazardous Waste Management  
Division

Enclosure